AMENDMENT TO THE CLAIMS

1.(currently amended) An apparatus for coupling to and retrofitting ~~a~~an existing process device, the apparatus providing a desired Safety Integrity Level (SIL) to the process device, comprising:

a device interface to retrofit to the existing process device and provide an output related to operation of a component of the process device, wherein the device interface comprises a connection to a databus of the process device which is used to transfer digital data between the component of the device and a microprocessor of the device;

a component monitor to retrofit to the existing process device, monitor data carried on the databus, and monitor operation of the component of the process device based upon the output from the device interface and responsively identify a safety event of the component indicative of a failure of the component and provide a safety event output; and

a safety response module to retrofit to the existing process device and respond to the safety event of the component based upon the safety event output in accordance with a safety response.

Claims 2-3 (canceled).

4. (original) The apparatus of claim 1 wherein the device interface comprises a sensor coupled to the process device.

5. (previously presented) The apparatus of claim 4 wherein the process device couples to a process control loop and the sensor monitors current flow in the process control loop.

6. (original) The apparatus of claim 5 wherein the component monitor compares the sensed current with a current value.

7. (original) The apparatus of claim 1 wherein the safety response module controls the current in a process control loop based upon a safety failure.

8. (original) The apparatus of claim 1 wherein the device interface comprises a watch dog circuit.

9. (previously presented) The apparatus of claim 1 wherein the device interface senses power drawn by circuitry of the process device.

10. (original) The apparatus of claim 1 wherein the device interface couples to a memory.

11. (previously presented) The apparatus of claim 10 wherein the component monitor detects errors in the data stored in the memory.

12. (original) The apparatus of claim 1 wherein the safety response module provides an alarm output.

13. (original) The apparatus of claim 1 wherein the safety response module disconnects the process device from a process control loop.

14. (original) The apparatus of claim 1 wherein the safety response module disconnects circuitry in the process device.

15. (original) The apparatus of claim 1 wherein the safety response module attempts to compensate for the safety failure.

16. (original) The apparatus of claim 14 wherein the safety response module corrects for errors in data in the device.

17. (original) The apparatus of claim 16 wherein the safety response module interpolates between data points in order to correct a data error.

18. (original) The apparatus of claim 16 wherein the safety response module holds a previous data point.

19. (original) The apparatus of claim 4 wherein the sensor comprises a voltage sensor.

20. (original) The apparatus of claim 4 wherein the sensor comprises a current sensor.

21. (previously presented) The apparatus of claim 1 wherein the device interface monitors data carried in a databus of the device.

22. (original) The apparatus of claim 1 wherein the component monitor comprises software implemented in a microprocessor of the device.

23. (original) The apparatus of claim 1 wherein the safety event comprises a possibility of a future component failure.

24. (original) The apparatus of claim 1 wherein the safety event comprises a detection of a component failure.

25. (original) A process variable transmitter including the apparatus of claim 1.

26. (original) The transmitter of claim 25 wherein the safety response module is implemented in a feature module which couples to a sensor module.

27. (previously presented) The transmitter of claim 25 wherein the safety response module is implemented in a feature module which couples to a plurality of sensor modules.

28. (previously presented) The transmitter of claim 25 wherein the component monitor monitors data from a sensor in the sensor module.

29. (original) The apparatus of claim 25 including a display and wherein the component monitors data sent to the display.

30. (original) A process controller including the apparatus of claim 1.

31. (original) A device in a Safety Instrumented System (SIS) in accordance with claim 1.

32. (previously presented) The apparatus of claim 1 wherein the component monitor monitors a plurality of process devices.

33. (original) The apparatus of claim 1 wherein the component monitor and safety response module are implemented in software.

34. (previously presented) The apparatus of claim 33 wherein the software upgrades an existing process device.

35. (previously presented) A feature module in accordance with claim 1 which upgrades an existing process device.

36. (currently amended) A transmitter for use in an industrial process, comprising:

a sensor module to couple to the process and measure a process variable;

a feature module configured to couple to the sensor module and retrofit ~~the~~an existing transmitter, the feature module including:

a device interface to couple to the process device and provide an output related to operation of a component of the process device, wherein the device interface couples to a databus of the sensor module, the databus used to transfer digital data between the component of the device and a microprocessor;

a component monitor to monitor operation of the component based upon the output from the device interface in response to the data carried on the databus and identify a safety event of the component and provide a safety event output; and

a safety response module in the transmitter which responds to the safety event of the component based upon the safety event output in accordance with a safety response.

37. (previously presented) A method of meeting Safety Integrity Level (SIL) in a process device, comprising:

obtaining an existing process device;

retrofitting a sensor module of the existing process device with a feature module;

sensing, from within the existing process device, operation of a component of the existing process device with the feature module, by coupling to a databus of the existing process device which carries data from the component to a microprocessor;

monitoring the sensed operation of the component by monitoring the data carried on the databus, identifying a safety event of the component and providing a safety event output with the feature module; and

responding to the safety event based upon the safety event output in accordance with a safety response with the feature module.

38. (canceled)

39. (original) The method of claim 37 wherein the sensing uses a sensor coupled to the process device.

40. (original) The method of claim 37 wherein the process device couples to a process control loop and sensing comprises sensing current flow in the process control loop.

41. (original) The method of claim 40 wherein monitoring comprises comparing the sensed current with a current value.

42. (original) The method of claim 37 wherein responding comprises controlling the current in a process control loop based upon a safety failure.

43. (original) The method of claim 37 wherein sensing comprises sensing power drawn by circuitry of the process device.

44. (original) The method of claim 37 wherein monitoring comprises detecting errors in the data stored in the memory.

45. (original) The method of claim 37 wherein responding comprises providing an alarm output.

46. (original) The method of claim 37 wherein responding comprises disconnecting the process device for a process control loop.

47. (original) The method of claim 37 wherein responding comprises compensating for the safety failure.

48. (original) The method of claim 37 wherein responding comprises correcting for errors in the data in the device.

49. (original) The method of claim 37 wherein sensing comprises sensing a voltage.

50. (original) The method of claim 37 wherein sensing comprises sensing a current.

51. (original) The method of claim 37 wherein the safety event comprises a possibility of a future component failure.

52. (currently amended) A process variable transmitter, comprising:

a process variable sensor to sense a process variable;

measurement circuitry to provide an output on a two wire process control loop related to the sensed process variable;

a retrofit apparatus to retrofit ~~the~~an existing process variable transmitter, comprising:

a device interface to retrofit to the existing process variable transmitter and provide an output related to operation of a component of the existing process ~~device~~variable transmitter, wherein the device interface comprises a connection to a databus of the existing process device which is used to transfer digital data between the component of the existing variable transmitter device and a microprocessor of the existing variable transmitter device;

a component monitor to retrofit to the process variable transmitter, monitor data carried on the databus and monitor operation of the component based upon the output from the device interface and identify a safety event of the component and provide a safety event output; and

a safety response module to retrofit to the process variable transmitter and respond to the safety event of the component based upon the safety event output in accordance with a safety response.

53. (previously presented) The apparatus of claim 52 wherein the retrofit apparatus comprises a feature module which couples to a sensor module.